

SOUTHWEST ALASKA
TRANSPORTATION PLAN

Preliminary Environmental Issues Identification
Technical Memorandum

prepared for the

Alaska Department of Transportation and Public Facilities

prepared by

HDR Alaska, Inc.

and

Parsons Brinckerhoff

in association with

Northern Economics

The Glosten Associates, Inc.

Ogden Beeman & Associates, Inc.

December 1997



Table of Contents

PURPOSE.....	1
METHODOLOGY	2
ENVIRONMENTAL ISSUES AND CONSTRAINTS	3
AIR QUALITY	3
NOISE	3
WATER QUALITY	3
WETLANDS	6
PROTECTED SPECIES	6
NATURAL HAZARDS.....	7
RADIOLOGICAL CONTAMINATION	9
LAND MANAGEMENT	10
SOCIAL, CULTURAL, HISTORIC ISSUES.....	19
TRANSPORTATION LEGISLATION.....	25
SECTION 4(f)	25
ALASKA NATIONAL INTEREST LANDS CONSERVATION ACT (ANILCA).....	25
BIBLIOGRAPHY	27

List of Tables

1996 IMPAIRED WATERBODIES LIST, SOUTHWEST ALASKA.....	4
IDENTIFIED WATER QUALITY ISSUES SOUTHWEST ALASKA COASTAL MANAGEMENT PLANS	5
PROTECTED SPECIES	7
SOUTHWEST ALASKA HISTORICALLY ACTIVE VOLCANIC PEAKS	8
IDENTIFIED NATURAL HAZARDS	9
NATIONAL PARKS AND MONUMENTS, SOUTHWEST ALASKA	10
IDENTIFIED STATE PARKS, SOUTHWEST ALASKA	12
IDENTIFIED DEVELOPED RECREATION AREAS.....	12
SOUTHWEST ALASKA FEDERAL WILDLIFE REFUGES	13
SOUTHWEST ALASKA STATE WILDLIFE REFUGES AND SANCTUARIES.....	13
SOUTHWEST ALASKA WILDERNESS AREAS.....	14
SOUTHWEST ALASKA STATE CRITICAL HABITAT AREAS	14
SOUTHWEST ALASKA WILD, SCENIC, AND RECREATIONAL RIVERS	15
ALASKA DEPARTMENT OF FISH AND GAME PROPOSED RESEARCH NATURAL AREAS	16
IDENTIFIED SUBSISTENCE USE AREAS	16
SOUTHWEST ALASKA COASTAL MANAGEMENT DISTRICTS	18
IDENTIFIED SPECIAL USE AREAS	19
NATIONAL HISTORIC REGISTER SOUTHWEST ALASKA/ALEUTIAN ISLANDS REGION	20
LOW INCOME AND ALASKA NATIVE POPULATIONS	22

PURPOSE

The purpose of this memorandum is to identify important environmental issues and constraints that may affect the implementation of transportation alternatives under consideration in the Southwest Alaska Transportation Plan. The analysis focuses on the identification of important environmental resources, known sensitive areas, and environmental issues. For the most part, the implications of these issues cannot be determined until alternatives have been developed. This memo will be used during alternatives evaluation to help determine the implications that the identified environmental resources, sensitive areas, and issues will have on constraining development of the alternatives.

It is important to note that this technical memorandum was conducted as a desktop exercise and is not a substitute for issue identification which will be accomplished through the public and agency involvement program for the plan. The purpose is to identify those areas within the region which are already experiencing impacts or are particularly sensitive to impacts. Transportation alternatives that exacerbate impacts in areas already experiencing impacts, or which introduce new impacts to the areas identified in this memorandum are likely to be examined with scrutiny from regulatory agencies and the public.

METHODOLOGY

The approach used in identifying environmental issues and constraints relied on a review of existing planning efforts conducted by the Alaska Department of Environmental Conservation, Alaska Department of Fish and Game, Alaska Coastal Management Program, Alaska Department of Community and Regional Affairs, Alaska Department of Natural Resources and others in Southwest Alaska. Coastal Management Plans, recent projects requiring National Environmental Policy Act documentation, National Park Service and Fish and Wildlife Management Plans, and Community Comprehensive Plans were reviewed to identify important environmental resources, known sensitive areas, and environmental issues. The following sources of information were used.

Coastal Management Plans. Coastal Management programs in Alaska include a resource inventory which describes the coastal habitats, major cultural resources, predominant land and water uses, major land and resource ownership and management responsibilities, and major historic, prehistoric, and archaeological resources. Also pertinent to the Southwest Alaska transportation planning effort is the discussion of transportation needs, objectives, and goals. Enforceable policies, required of the coastal management programs, also cover infrastructure development and could have an effect on transportation alternatives. Information was acquired from Coastal Management Plans for Aleutians West Coastal Resource Service Area, Aleutians East Coastal Resource Service Area, Lake and Peninsula Borough, Kodiak Island Borough, Bristol Bay Borough, St. Paul, and Cenaliulriit.

National Environmental Policy Act Documents (NEPA). Projects that require compliance with NEPA often result in documents that include background discussion of the affected area summarized by topics. As such, NEPA-based documents often provide an excellent source of documentation of environmentally sensitive areas and related potential environmental information. Several NEPA-based documents from projects in Southwest Alaska provide important information on the environmental conditions, issues, constraints, and land management pertinent to development of transportation alternatives. The most relevant NEPA documents include Environmental Impact Statements for the Alaska Maritime National Wildlife Refuge, Alaska Peninsula National Wildlife Refuge, Becharof National Wildlife Refuge, Izembek National Wildlife Refuge, Kodiak National Wildlife Refuge, and Togiak National Wildlife Refuge.

Land Management Plans. Land Management Plans were reviewed for environmental issues relating to transportation development. These plans provide important information, particularly as a supplement to Coastal Management documents. Conservation Plans for the Alaska Maritime National Wildlife Refuge, Alaska Peninsula National Wildlife Refuge, Aniakchak National Monument and Preserve, Becharof National Wildlife Refuge, Fort Abercrombie State Historic Park, Izembek National Wildlife Refuge, Katmai National Park and Preserve, Kodiak National Wildlife Refuge, Lake Clark National Park and Preserve, Pasagshak River State Recreation Site, Togiak National Wildlife Refuge, and Wood-Tikchik State Park were collected and reviewed.

ENVIRONMENTAL ISSUES AND CONSTRAINTS

AIR QUALITY

The Environmental Protection Agency has established National Ambient Air Quality Standards (NAAQS) for several pollutants. Known as “criteria pollutants,” these are pollutants that can harm human health. Criteria pollutants with NAAQS include carbon monoxide (CO), small particulate matter (PM₁₀), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), ozone (O₃), and lead (Pb). Where transportation alternatives are located in non-attainment areas or where investments could cause violations of one or more of the NAAQS, a quantitative analysis of the impacts is required, usually as part of the environmental process.

With only a few localized exceptions, air quality in Southwest Alaska is considered good to excellent. Frequent winds and storm systems provide sufficient air exchange to make most site-specific air quality problems temporary. Commercial fishing and seafood processing often present air quality concerns in Southwest Alaska and the increased use of local harbors by a variety of fishing vessels does cause occasional site-specific air contamination in the harbor areas. Site-specific air quality problems have also been identified at some of the Southwest Alaska fish processing plants. Air quality problems also exist in Southwest communities due to unpaved roads which result in particulate concentration problems in the air. Transportation alternatives that exacerbate air quality conditions in these areas will likely face increased concerns of air quality degradation.

NOISE

Many types of transportation investments have the potential to increase noise and vibration levels. Sources of transportation noise typically include vehicle operating noise whether from cars, trucks, busses, airplanes, or marine vessels. Transportation noise may affect a community in two ways, (1) the noise may be frequent enough and loud enough to increase the cumulative noise considerably, or (2) the noise may last only a short duration which does not increase the overall noise level considerably but which may still be an impact. The most prominent sources of noise in Southwest Alaska come from marine vessels and airplanes. In many Southwest Alaska communities harbor facilities have been developed close to town and are often located in the heart of the developed area. Marine traffic, which often includes large ocean-going vessels, is concentrated at these locations causing noise impacts. Noise impacts are exacerbated by topography in many locations, where mountainous terrain forms natural amphitheatres or walls which bounce the sound back into the community. Airstrips and seaplane landing areas close to a community also cause noise impacts, particularly where approach areas take planes over the community. Noise will also likely be an issue where it has the ability to affect wildlife when transportation alternatives come in close proximity to important habitat areas such as the alternatives to improve access between King Cove and Cold Bay through the Izembek National Wildlife Refuge.

WATER QUALITY

Water quality can typically be affected by transportation alternatives in one of three ways: (1) dredging, discharging fill material, or introducing pollutants into the water; (2) altering surface

drainage patterns or increasing runoff; or (3) affecting the water table by dewatering or contaminating the ground water. Wastewater from maintenance facilities or storm water runoff can be a source of contamination. A National Pollutant Discharge Elimination System permit may be required under the Clean Water Act, if wastewater is discharged into a storm water system. Dredging or discharging of fill material into waters of the United States, including wetlands, must comply with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

Several Southwest Alaska communities have identifiable water quality issues. Marine waters near communities are influenced by discharges of sewage effluent, process waters and wastes from seafood operations, oily water discharges from bilge pumping, and spills of petroleum products associated with the transportation, storage, and distribution of gasoline, fuel, oil, diesel, and lubricants. High levels of rainfall generally provide communities with an adequate supply of good water. However, water quality is considered to be a major issue by local residents. The following table lists the water quality limited waterbodies for Southwest Alaska that the Alaska Department of Environmental Conservation (DEC) submitted to the Environmental Protection Agency in its 1996 Section 305(b) and Section 303(d) submittal. Water quality concerns and DEC regulations could affect the development of transportation improvements that have the potential to further impact these water bodies.

1996 Impaired Waterbodies List, Southwest Alaska

Waterbody	Location	Pollutant	Source
Eskimo Creek	King Salmon	Petroleum, Hydrocarbons, Metals, Pesticides, Trichloroethylene	Landfill, Fuel Storage
Iliuliuk Bay/Harbor	Dutch Harbor	Petroleum Products	Urban Runoff
King Cove	King Cove	Seafood Residue	Seafood Processing/Waste
King Salmon Creek	King Salmon	Petroleum Hydrocarbons, Metals, Pesticides	Landfill, Fuel Storage
Naknek River	King Salmon	Petroleum Hydrocarbons, Metal	Landfill, Fuel Storage
Red Fox Creek	King Salmon	Petroleum Hydrocarbons, Metals	Landfill, Fuel Storage
Red Lake – Anton Road Ponds	Kodiak	Debris, Metals, Petroleum Products	Urban Runoff
Udagak Bay	Unalaska Island	Settlable Solids	Seafood Processing

Source: Section 305(b) and Section 303(d) Submittal, Alaska Department of Environmental Conservation

Other specific water quality issues were identified through a search of the Coastal Management Programs, National Wildlife Refuge and National Park Service Documents, and the Cumulative Impacts in Alaska Report. Some of the waterbodies listed have been affected in the past, raising public or agency concerns, others are watersheds specifically identified by the plans as needing special consideration. Transportation alternatives that affect these waterbodies will likely face additional scrutiny.

*Identified Water Quality Issues
Southwest Alaska Coastal Management Plans*

Coastal District	Waterbody	Water Quality Issues
Adak	Eskimo Creek	Septic and hydrocarbons
Akutan	Akutan Harbor	Processing plants, new 800' – 1000' sheetpile bulkhead
King Cove	Harbor, Bay, Popof Strait	Waste accumulation
Dillingham area	Banks, Streams, Wetlands	Docks and facilities change bank stabilization/erosion, road crossings from new roads
Dutch Harbor	Dutch Harbor	Seafood processing, seafood waste discharge, oil wastes from buried storage tanks
Inner Unalaska	Unalaska Harbor	Harbor development, fish processing, sediment deposition from vessel washing
Kodiak	Viewshed	Logging and recreation development
South Unalaska	Unalaska Bay	Seafood processing and discharge, fills, and docks
Unalaska	Unalaska Bay	Cannery pollution, commercial fisheries, fishing vessel and processing discharge

Source: HDR Alaska, Inc. Cumulative Impacts in Alaska. June 1995

An issue of concern for several communities in Southwest Alaska is the transportation and storage of hazardous materials, particularly petroleum products. Timing and shipment information regarding these shipments may not always reach the communities and residents have expressed concern about the ability of shippers to respond to an accident in a timely and effective manner.

Non-point source pollution is also a relevant transportation issue. The 1990 US Coastal Zone Reauthorization Amendments (Section 6217) and the Alaska Department of Conservation Alaska Non-Point Source Strategy, currently under development, address non-point source pollution and should be cited particularly for areas not within Coastal Boundaries. Based on

these requirements, the DOT&PF has adopted a Best Management Practices (BMPs) manual to address non-point source pollution, which is modeled on standards established by the American Association of State Highway and Transportation Officials. Any transportation project receiving Federal Highway Administration funds must now meet these non-point source guidelines. Moreover, the Alaska Harbormasters are developing a set of BMPs in conjunction with the regulatory agencies to address runoff, drainage, and water quality concerns at boat harbors.

WETLANDS

Wetlands are areas that are inundated or saturated by surface or ground water for a sufficient amount of time to support a prevalence of vegetation suited to surviving in saturated soil conditions. Executive Order 11990, "Protection of Wetlands" requires federal agencies to avoid direct or indirect support of projects that involve new construction in wetlands when there is a practicable alternative. Moreover, for transportation investments that could affect a wetland, U.S. DOT Order 56601.1A, "Preservation of the Nation's Wetlands," requires that a wetlands analysis be performed. If the analysis indicates a significant impact on wetlands an environmental impact statement is required. The U.S. Army Corps of Engineers (COE) has primary responsibility for regulation of wetlands. Proposals for fill placement in wetlands require authorization from the COE, with concurrence of other federal agencies such as the Fish and Wildlife Service and the Environmental Protection Agency.

Wetland areas are found in many areas throughout Southwest Alaska and are too numerous to identify. Every Coastal Management Plan includes wetlands as a habitat protection issue. To better gauge specific wetlands from a transportation alternative it will be necessary to consult the U.S. Fish and Wildlife Service National Wetland Inventory Maps or regional or site-specific wetlands mapping.

PROTECTED SPECIES

Endangered Species are protected by the Endangered Species Act of 1973 (16 U.S.C. 1531). Section 7 of the Act requires consultation with the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) to ensure that projects do not jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. In general, marine species are under the jurisdiction of the NMFS and all other species are under jurisdiction of the United States Fish Wildlife Service. The protection afforded to Protected Species or their habitat can constrain transportation projects and is a consideration in the project development phase.

There are several categories of protected species relevant to Southwest Alaska. An "endangered species" is defined as one that is in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined as one that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. "Candidate species" are those species for which the USFWS has sufficient information on the species biological vulnerability and threats, to support issuance of a proposed rule to list the species under the Endangered Species Act. "Species of concern" refers to species for which a listing of threatened or endangered may be appropriate but which the USFWS has insufficient information to support their listing.

Protected species which could inhabit the Southwest Alaska Region are identified from a review of the Comprehensive Planning documents and the endangered, threatened and candidate species lists maintained by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

Protected Species

Status	Species
Federally Listed Threatened Species	Aleutian Canada Goose, Steller Sea Lion, Spectaled Eider, Steller's Eider (Proposed)
USFWS Species of Concern	Beluga Whale, Harbor Seal, , Northern Fur Seal, Blackpoll Warbler, Gray-Cheeked Thrush, Northern Goshawk, Olive-Sided Flycatcher, Townsend's Warbler
Federally Listed Endangered Species	Blue Whale, Eskimo Curlew, Humpback Whale, Sei Whale, Finback Whale, Northern Right Whale, Sperm Whale, Short-tailed Albatross, Chinese Egret, Aleutian Shield Fern, American Peregrine Falcon, Short-Tailed Albatross
Candidate Species	None

Source: AKFG, USFWS, NOAA, USBLM, USFS 1997

NATURAL HAZARDS

Natural hazards can limit and constrain the location and design of transportation improvements. Development of transportation alternatives in Southwest Alaska must consider several natural hazards. All of Southwest Alaska is subject to earthquakes and associated Tsunamis, slope failure, mass wasting, sea ice, storm surges, flooding, and avalanches. Due to the Aleutian Trench, the Aleutian Islands arc system is the most seismically active part of Alaska. Southwest Alaska is home to approximately 38 historically active volcanoes. These volcanoes are listed as such primarily because they all have erupted within the last ten thousand years and may erupt in the future. In addition to location and design considerations, volcanic eruptions interfere with air and surface transportation operations because of ash and particulate intake into internal combustion engines.

*Southwest Alaska
Historically Active Volcanic Peaks*

Volcano	Location	Volcano	Location
Akutan	Akutan Island	Kiska	Rat Islands
Amukta	Islands of Four Mtns.	Korovin	Atka Island
Aniakchak	Aniakchak Nat'l Mon.	Little Sitkin	Rat Islands
Augustine	Augustine Island	Mageik	Katmai National Park
Bogoslof	Fox Islands	Makushin	Unalaska Island
Carlisle	Islands of Four Mtns.	Martin	Katmai National Park
Cerberus (Semisopochnoi)	Rat Islands	Novarupta	Katmai National Park
Chiginagak	Alaska Peninsula	Okmok	Umnak Island
Cleveland	Islands of Four Mtns.	Pavlof	Alaska Peninsula
Dutton	Alaska Peninsula	Peulik	Alaska Peninsula
Fisher	Alaska Peninsula	Seguam	Andreanof Islands
Gareloi	Andreanof Islands	Shishaldin	Unimak Island
Great Sitkin	Andreanof Islands	Tanaga	Andreanof Islands
Iliamna	Lake Clark Nat'l. Park	Trident	Katmai National Park
Isanotski	Unimak Island	Ukinrek	Alaska Peninsula
Kagamil	Islands of Four Mtns.	Veniaminof	Alaska Peninsula
Kanaga	Andreanof Islands	Vsevidof	Umnak Island
Kasatochi	Andreanof Islands	Westdahl	Alaska Peninsula
Katmai	Katmai National Park	Yunaska	Islands of Four Mtns.

Source: Quick Reference to Alaska's Active Volcanoes and Listing of Historical eruptions.
USGS, Alaska Volcano Observatory. 1995.

The following table lists natural hazards for communities within the Southwest Alaska Region. These hazards were identified through a review of National Wildlife Refuge documents, Coastal Management Programs, and Environmental Impact Statements.

Identified Natural Hazards

Coastal District	Hazards
Aleutians East	Seismic Activity and Volcanic Eruptions with associated Tsunamis, Ground Motion, Landslides, Ash Falls
Aleutians West	Seismic Activity and Volcanic Eruptions with associated Tsunamis, Ground Motion, Landslides, Ash Falls
Becharof	Seismic Activity and Volcanic Eruptions with associated Tsunamis, Ash Falls, Flooding
Bristol Bay	Seismic Activity, Volcanic Activity, Tsunami, Sea Ice, Storm Surges, Slope Failure, Flooding, Erosion
Cenaliurrit District	Seismic Activity, Volcanic Eruptions, Flooding, Erosion, Shorefast Ice, Permafrost
Kodiak Archipelago	Seismic Activity and Volcanic Eruptions with associated Tsunamis, Ground Motion, Landslides, Ash Falls, Flooding, Avalanches, Coastal Erosion, Wind Damage, Mass Wasting
Lake and Peninsula Borough	Seismic Activity And Volcanic Eruptions with associated Tsunamis, Ground Motion, Landslides, Ash Falls
St. Paul	Volcanic Activity, Seismic Activity, Erosion, Tsunamis, Ground Motion, Landslides, Ash Falls

RADIOLOGICAL CONTAMINATION

Another potential hazard to transportation alternatives results from the Vela Uniform Program which was conducted as part of a research and development program to improve the capability of detecting, monitoring, and identifying underground nuclear explosions. Amchitka Island was one of several locations involved in the program. Project Long Shot test was conducted in October 1965 at a depth of 2,300 feet. The test was designed to determine the behavior and characteristics of seismic signals generated by nuclear explosions. Two other nuclear detonations, not part of the Vela Uniform Program, Project Milrow, a high-yield seismic calibration test conducted in October 1969 at a depth of 4,000 feet, and Project Cannikan, a test of a proposed warhead for the Spartan missile, were conducted in November 1971 at a depth of 5,875 feet. Of the three tests, only Project Long Shot produced detectable surface radiological contamination. Results from a study conducted by the U.S. Department of Energy last year appear to confirm that no radiation is "leaking" following the three underground nuclear weapons tests. Recent studies, however, have disputed this claim.

LAND MANAGEMENT

Many sensitive areas and environmental resources in Southwest Alaska are protected by special land management status under public ownership. In some cases the protections are mandated by federal law, in others the protection is prescribed by land management plans covering the sensitive area. It is likely that transportation alternatives will face constraints and additional scrutiny if they impact specially managed areas. In some areas, transportation improvements are precluded. This section identifies sensitive areas in Southwest Alaska that are managed to protect the environmental resources and sensitive aspects that could affect development of transportation alternatives.

National Parks and Monuments. National parks and monuments are managed by the National Park Service. They are protected in statute and by land management plans governing their administration. In general, national parks and monuments are managed to protect the values for which they were established. Management plans covering the areas should be consulted for specific policies. National preserves are managed as a unit of the National Park System in the same manner as a national park except regarding subsistence hunting. The following national parks and monuments were identified in Southwest Alaska.

These parks and monuments were established by the Alaska National Interest Lands Conservation Act (ANILCA). Title XI of ANILCA governs the routing of transportation systems in conservation system units including these national parks and monuments. The conservation system units in Southwest Alaska are shown on the map on the following page.

National Parks and Monuments, Southwest Alaska

Aniakchak National Monument and Preserve

Katmai National Park and Preserve

Lake Clark National Park and Preserve

Source: DeLorme Mapping. Alaska Atlas & Gazetteer. 1992

Federal Conservation System Units

Saint Paul
Pribilof Islands
Saint George



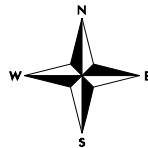
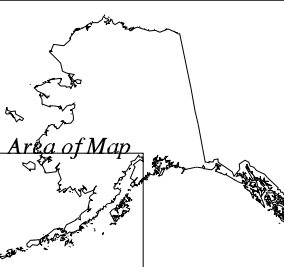
Southwest Alaska Transportation Plan



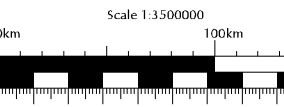
File: swstat.aml Date: 10/22/97 By: PKW

Legend

- Conservation System Units
- Aniakchak NM&P
 - Alaska Maritime NWR
 - Alaska Peninsula NWR
 - Izembek NWR
 - Kenai NWR
 - Kodiak NWR
 - Togiak NWR
 - Katmai NP&P
 - Becharof NWR
 - Lake Clark NP&P



Data Sources:
Alaska Department of Natural Resources
Alaska Department of Transportation
Federal Aviation Administration



Projection: Albers
Units: Meters
Spheroid: Clarke1866
1st standard parallel: 55 0 0.0
2nd standard parallel: 65 0 0.0
central meridian: -154 0 0.0
latitude of projection's origin: 50 0 0.0

State Parks and Recreation Areas. State parks are managed by the Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation. The following state parks and recreation areas are located in Southwest Alaska. State parks are protected by state statute and area-specific management plans. Parks are also subject to Section 4(f) of the U.S. Department of Transportation (DOT).

Identified State Parks, Southwest Alaska

State Park	Nearest Community
Buskin River State Recreation Site	Kodiak
Fort Abercrombie State Historic Park	Kodiak
Pasagshak River State Recreation Site	Kodiak
Shuyak Island State Park	Kodiak
Wood-Tikchik State Park	Dillingham

Source: AK DNR. Catalog of the Alaska State Park System

The areas noted below were identified using information from the Alaska Department of Natural Resources Parks and Recreation Division and the Alaska Almanac as developed parks and recreation sites and are managed as such. These areas have special land management proscriptions and are also subject to Section 4(f) of the U.S. Department of Transportation (DOT) Act.

Identified Developed Recreation Areas

Recreation Areas	Location
Miller Bay, Miller Point	Fort Abercrombie State Historic Park
Newhalen River	Lake Clark National Park and Preserve
Pasagshak Bay	Pasagshak State Recreation Site
Wood River	Wood-Tikchik State Park

Source: Alaska Department of Natural Resources. Alaska Northwest Books. The Alaska Almanac. 1993

Wildlife Refuges. The following areas have been set aside as having special wildlife habitat values. State wildlife refuges are protected by state statute and are managed by the Alaska Department of Fish and Game. National refuges are part of the National Wildlife Refuge System and are managed by the U.S. Fish and Wildlife Service. Wildlife refuges are typically managed to preserve the wildlife and habitat resources among other values for which they were established. Refuge specific management plans should be consulted for further information.

Wildlife refuges are subject to Section 4(f) of the U.S. Department of Transportation Act and Federal Refuges are subject to Title XI of ANILCA.

Southwest Alaska Federal Wildlife Refuges

Refuge	Location
Alaska Maritime National Wildlife Refuge	Aleutian Islands and islands offshore of the Alaska Peninsula
Alaska Peninsula National Wildlife Refuge	Southwest Alaska Peninsula
Becharof National Wildlife Refuge	Alaska Peninsula
Izembek National Wildlife Refuge	Cold Bay
Kodiak National Wildlife Refuge	Kodiak Archipelago
Togiak National Wildlife Refuge	Togiak

Source: DeLorme Mapping. Alaska Atlas & Gazetteer. 1992

Southwest Alaska State Wildlife Refuges and Sanctuaries

Refuge/Sanctuary	Location
Cape Newenham State Refuge	Togiak National Wildlife Refuge
Izembek State Refuge	Izembek National Wildlife Range
McNeil State Game Sanctuary	Kamishak Bay
Walrus Island State Game Sanctuary	Togiak National Wildlife Refuge

Source: AK DFG. State of Alaska Refuges, Critical Habitat Areas and Sanctuaries. March 1991

Wilderness Areas. Wilderness areas in Southwest Alaska were established by ANILCA in accordance with the purposes of the Wilderness Act of 1964. Wilderness areas are managed for the preservation of wilderness character, that is, “to preserve the area such that the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain.” Generally roads and motorized access are not allowed except for fixed-wing airplanes, motorboats, and snowmachines. Access is provided for in ANILCA sections 811, 1010, 1110, 1111, 1310, 1315(b), and 1323. Wilderness areas are considered conservation system units and are subject to Title XI of ANILCA.

Southwest Alaska Wilderness Areas

Wilderness Area	Location
Aleutian Islands Wilderness	Alaska Maritime National Wildlife Refuge
Becharof Wilderness	Becharof National Wildlife Refuge
Bogoslof Wilderness	Alaska Maritime National Wildlife Refuge
Chignik Wilderness	Alaska Peninsula National Wildlife Refuge
Izembek Wilderness	Izembek National Wildlife Refuge
Katmai Wilderness Park	Katmai National Park
Kodiak Wilderness	Kodiak National Wildlife Refuge
Pavlof Wilderness	Alaska Peninsula National Wildlife Refuge
Semidi Wilderness	Alaska Maritime National Wildlife Refuge
Simeonof Wilderness	Alaska Maritime National Wildlife Refuge
Togiak Wilderness	Togiak National Wildlife Refuge
Ugashik Wilderness	Alaska Peninsula National Wildlife Refuge
Unimak Wilderness	Alaska Maritime National Wildlife Refuge

State Critical Habitat Areas. Southwest Alaska contains a number of State Critical Habitat Areas. These areas have been designated as such to provide a level of management and protection commensurate with the unique fish and wildlife values for these areas. The following table lists the current Southwest Alaska State Critical Habitat Areas.

Southwest Alaska State Critical Habitat Areas

Cinder River State Critical Habitat Area
Egegik State Critical Habitat Area
Pilot Point State Critical Habitat Area
Port Heiden State Critical Habitat Area
Port Moller State Critical Habitat Area
Tugidak Island State Critical Habitat Area

Source: AK DFG. State of Alaska Refuges, Critical Habitat Areas and Sanctuaries. March 1991

Wild, Scenic, and Recreational Rivers. The Wild and Scenic Rivers Act of 1968 provides a means for identifying and protecting outstandingly remarkable scenic, recreation, geologic, fish and wildlife, historic, cultural, ecological, and other values of the nation's rivers. The intent of the Act is to preserve the free-flowing condition of the rivers and the characteristics of the river's immediate environment. As such, depending on the classification of the river, transportation alternatives could be constrained by the Act.

There are three classes of rivers established by the Act, "wild," "scenic," and "recreational." The previous definitions are used by the Act to specify the classification of rivers subject to the Act. Wild rivers are described as "Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive..." Scenic rivers are "those rivers or section of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads." Scenic rivers are "those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past." The following table lists Southwest Alaska rivers designated under the National Wild and Scenic Rivers Act.

Southwest Alaska Wild, Scenic, and Recreational Rivers

River	Location
Alagnak River	Katmai National Park
Albert Johnson Creek	Aniakchak National Monument and Preserve
Aniakchak River	Aniakchak National Monument and Preserve
Chilikadrotna River	Lake Clark National Park and Preserve
Hidden Creek	Aniakchak National Monument and Preserve
Mulchatna River	Lake Clark National Park and Preserve
Mystery Creek	Aniakchak National Monument and Preserve
North Fork Aniakchak River	Aniakchak National Monument and Preserve
Tlikakila River	Lake Clark National Park and Preserve

Source: United States Department of the Interior. ANILCA. 1983

Research Natural Areas. Research Natural Areas are established to preserve areas of ecological importance in their natural condition for the purposes of research, monitoring, education, and/or to maintain natural diversity. Unless otherwise specified in the management plan, roads are not allowed unless they contribute to the objectives or protection of the area. The following research natural areas are described by the plan.

*Alaska Department of Fish and Game
Proposed Research Natural Areas*

Location	Proposed Research Natural Areas
Aleutians East Borough	Canoe Bay, Hoodo Lake, Herendeen Bay, Sapsuk River, Sandy River, Bear Lake

Source: Alaska Coastal Management Program. Aleutians East Coastal Resource Service Area. July 1985

Subsistence. Subsistence hunting and fishing activities are important to residents of Southwest Alaska. Subsistence management and uses on federal lands are subject to Title VIII of ANILCA. In particular, Section 810 describes management of land uses that could restrict subsistence uses. An evaluation (810 evaluation) is required by the head of the federal agency having primary jurisdiction over the land proposed for use to determine the affects on subsistence resources. State management of substance activities is currently being debated. At this time it is unclear as to what level of federal and state agencies involvement will be in the regulation of subsistence activities.

A review of the plans found the following main types of issues regarding transportation's affects on subsistence resources in Southwest Alaska.

- Human activity, particularly boating and harbor operations, impacts subsistence marine resources.
- Competition among commercial, sport, and subsistence use of the resources is often caused by improved access.
- Improved accessibility puts increased pressure on subsistence resource populations. That is, the indirect impact of increased competition for fish and game resources due to better access and more people.
- The direct impact of displacing animal or fish populations, affecting their habitat, or impacting sites customarily used for harvesting.

Identified Subsistence Use Areas

Coastal District	Subsistence Use Areas
Atka	Nazan Bay/Uyak Island, Unnamed, Unnamed, Old Harbor, Cape Korovin, Head of Korovin Bay, Martin Harbor, Sarana Cove, Egg Bay, Salt Reef, Deep Bay, Bluefox Bay, Unnamed, Beaver Bay, Kobakof Bay, Sagchudak Island, Sadatanak Island, Unnamed, Vasilief Islands, Vasilief Bay, Cape Utalug to Emily, Eddy Point, West Amlia Pass, Cape Utes

Coastal District	Subsistence Use Areas
Chignik	Chignik Lake, Chignik Lagoon, Chignik Bay, Meshik River, Black Lake drainage, Castle Bay, Ivanof Bay, Mud Bay
Egegik	Egegik Rapids, Becharof Lake, Naknek River, Kejulik, Lake near Whale Mountain, King Salmon River, Kejulik River Valley, South Katmai Bay
Izembek	Coastline and inland of Izembek Lagoon and Kinzarof Lagoon, Big Lagoon, Grant Point, Applegate Cove
Kodiak Island (Karluk)	From Inner Seal Rock to mouth of Karluk River to Harvester Island and all of the coast areas of Uyak and Spiridon Bays, extending to Cape Kuliuk
Kodiak Island (Larsen Bay)	From mouth of Karluk River to Harvester Island and Uyak Bay, Larsen Bay, and Spiridon Bay extending to Cape Kuliuk
Kodiak Island (Old Harbor)	Narrow Cape to Geese Channel and the coastal areas of Ugak Bay, Sitkalidak Strait, Kaiugnak Bay, and Kaguyak Bay. Sitkalidak Island, Twoheaded Island, and Geese Island
Kodiak Island (Other)	South Afognak Island, Tonki Bay, Marmot Strait, Izhut Bay, Marmot Bay, Kizhuyak Bay, Kupreanof Strait, Viekoda Bay, Uganik Passage, Uganik Bay, Raspberry Strait, Malina Bay, and Paramanof Bay. Portions of Spruce, Whale, Raspberry, Uganik Islands
Kodiak Island (Akhiok)	Alitak Bay from Cape Alitak to Humpy Cove to the south from Stockholm Point to the entrance of Olga Bay
Naknek	Naknek River, Big Creek, Kejulik River, Becharof Lake, King Salmon Creek, King Salmon River
Nikolski	Nikolski Offshore, Pancake Rocks, Adugak Island, Nikolski Subsistence Area
Pavlof	Herendeen Bay, Port Moller Bay, Canoe Bay, Pavlof Bay, Balboa Bay, Bechevin Bay, Unimak Island, Izembek Refuge, Thinpoint Lake, Traders Mountain, Chinaman Lagoon, Jackson Lagoon, Mortensen Lagoon, Nurse Lagoon, Russell Creek, Trout Creek, Delta Creek, Canoe River
St. Paul	St. Paul Island, Walrus Island, Otter Island
Togiak	Nushagak Bay, Nushagak River, Togiak Lake, Igushik River, Kulukak Bay, Togiak Bay, Aleknagik, Nichols Spit, Protection Point, Tongue Point, Estus Point, Asigyukpak Spit, Nanvak Bay, Chagvan Bay, Carter Bay, Goodnews Bay, Platinum, Quinhagak, Kanektok River, Arolik River, Kisaralik River, Osviak Bay, Jacksmith Bay, Kagati Lake
Ugashik	Ugashik Lakes, Dog Salmon River, Mother Goose Lake

Coastal District	Subsistence Use Areas
Unalaska	Priest Rock, Constantine Bay, Foot of Split Top, Iliuliuk Bay, West Side Captain's Bay, Devilfish Point/Hog Island, Nateekin, Wide Bay/Broad Bay, Eider Point, Chernofski Harbor, Beaver Inlet, Kalketa Bay

Coastal Management. Coastal Management Plans have been developed for nearly all of Southwest Alaska. The state standards for transportation and utilities (6 AAC 80.080) require that transportation routes and facilities be sited inland from beaches and shorelines unless the route or facility is water-dependent or no feasible and prudent inland alternative exists to meet the public need for the project. In addition, the standards require that transportation routes and facilities in the coastal area be sited, designed, and constructed so as to be compatible with local district programs. The following table lists the coastal management districts in Southwest Alaska.

Southwest Alaska Coastal Management Districts

Aleutians West
Aleutians East
Bristol Bay
Cenaliulrit
Kodiak Island
Lake and Peninsula
St. Paul

District coastal management programs also identify and provide special protection to sensitive areas and environmental resources. "Area Meriting Special Attention" (AMSA) is an official designation provided to areas important to subsistence, areas with special scientific values or opportunities, or areas with potential for estuarine or marine sanctuaries. Other sensitive areas not formally designated as AMSA are also identified in the plans and often have particular importance to the communities. A review of the coastal management programs identified the following special use areas for Southwest Alaska.

Identified Special Use Areas

Location	Special Use Areas	Primary Value
Bechevin Bay	Bechevin Bay and North Morzhovoi Bay	Estuarine Habitat
Bristol Bay (proposed AMSA)	Togiak Bay past Hagemeister Island to Kulukak Bay, High Island, Summit Island, Crooked Island, Round Island	Habitat, Subsistence
Bristol Bay AMSA	Nushagak and Mulchatna Rivers Recreation Area	Habitat, Subsistence, Recreation
Cenaliulriit (proposed AMSA)	Nash Harbor	Seabird and Marine Mammal Habitat
Chernofski (proposed AMSA)	Chernofski Harbor	Habitat, Historical
Izembek Lagoon	Izembek Lagoon and Moffet Lagoon	Estuarine Habitat
Kodiak Island Borough (AMSA)	Shuyak Island, Raspberry Island, Karluk Lake and River, Womens Bay, Middle Bay	Habitat, Recreation, Economical & Residential
Nelson Lagoon	Nelson Lagoon	Port Moller State Critical Habitat Area
Pavlof/Canoe Bay	Pavlof/Canoe Bay	Marine Habitat
Port Moller, Herendeen Bay, Bear River	Port Moller, Herendeen Bay, Bear River	Port Moller State Critical Habitat Area
Unalaska Bay (proposed AMSA)	Unalaska Bay, Dutch Harbor	Subsistence, Recreation, Habitat, Historical
Unimak Pass	Unimak Pass	Migratory Pathways, Habitat

SOCIAL, CULTURAL, HISTORIC ISSUES

Historic Resources. Transportation projects that affect historic or cultural sites are subject to Section 106 of the National Historic Preservation Act. The Act requires that federal agencies identify and assess the effects of expenditures of federal funds on historic and archaeological sites. The Act requires agencies to provide the Advisory Council on Historic Preservation an opportunity to comment on activities with the potential to impact historic properties. In addition, to the extent possible, impacts on the properties must be mitigated. Properties subject to the Act are those on or eligible for the National Register of Historic Places. State law also protects historic sites and all projects should be coordinated with the State Historic Preservation Officer. Cultural resources are also covered. The following tables lists Southwest Alaska sites recorded on the National Historic Register.

*National Historic Register
Southwest Alaska/Aleutian Islands Region*

Location	Site
Afognak	Nativity of Our Lord Chapel
Akhiok	Protection of the Theotokos Chapel
Akutan	St. Alexander Nevsky Chapel
Aleutian Islands	Temnac P-38G Lightning
Amaknak Island	Dutch Harbor Naval Operating Base; Fort Mears, U.S. Army
Amaknak Island	Sitka Spruce Plantation
Ananiuliak	Ananiuliak Island Archeological District
Aniakchak National Preserve	Aniakchak Bay Historic Landscape District
Atka	Atka B-24D Liberator
Attu Island	Attu Battlefield and U.S. Army and Navy Airfield
Belkofski	Holy Resurrection Church
Cape Adagdak	Adak Army and Naval Operating Station
Dillingham	Fisherman's Co-op
Dillingham	Pilgrim 100B Aircraft
Ekuk	St. Nicholas Chapel
Igiugig	St. Nicholas Church
Kanatak	Archeological Site 49 MK 10
Kanatak	Archeological Site 49 AF 3
Kanatak	Kukak Village Site
Kanatak	Takli Island Archeological District
Karluk	Ascension of Our Lord Chapel
Katmai National Park	Kaguyak Village Site
King Salmon	Fure's Cabin
Kiska Island	Japanese Occupation Site

Location	Site
Kodiak	AHRS Site KOD-207
Kodiak	Erskine House
Kodiak	Holy Resurrection Church
Kodiak	Kodiak 011 Site
Kodiak	Kodiak Naval Operating Base and Fort Abercrombie
Kodiak Miller Point	Fort Abercrombie State Historic Site
Kodiak Upper Mill Bay	American Cemetery
Larsen Bay	KOD-171
Larsen Bay	KOD-233
Naknek	Brooks River Archeological District
Naknek	Kijik Historic District
Naknek	Old Savonoski Site
Naknek	Savonoski River Archeological District
Nikolski	Anangula Archeological District
Nikolski	St. Nicholas Church
Nikolski	Chaluka Site
Nondalton	Kijik Archeological District
Nondalton	St. Nicholas Chapel
Nushagak	Transfiguration of Our Lord Chapel
Old Harbor	Three Saints Site
Ouzinkie	Nativity of our Lord Chapel
Ouzinkie	Sts. Sergius and Herman of Valaam Chapel
Pedro Bay	St. Nicholas Chapel
Perryville	St. John the Theologian Church
Pilot Point	St. Nicholas Church
Port Moller	Port Moller Hot Springs Village Site
Sand Point	St. Nicholas Chapel

Location	Site
South Naknek	Elevation of Holy Cross Church
St. George Island	St. George the Great Martyr Orthodox Church
St. Paul and St. George	Fur Seals Rookeries
St. Paul Island	Sts. Peter and Paul Church
Unalaska	Church of the Holy Ascension
Unalaska	S.S. Northwestern Shipwreck Site
Umnak Island	Cape Field at Fort Glenn

Executive Order 12898 (Environmental Justice). Executive Order 12898 applies to federal actions to address environmental justice in minority group and low income populations. This order calls for strategies to identify and address disproportionately high and adverse human health and environmental impacts on low income and minority group populations. In Southwest Alaska there is a significant minority group Alaska Native population. In addition, much of the population is economically disadvantaged. These could become factors under Executive Order 12898. The table below lists the Alaska Native population percentage and below-poverty-level percentage for Southwest Alaska communities.

Low Income and Alaska Native Populations

Location	% Alaska Native	% Below Poverty Level
Adak Island	1.2%	2.0%
Akhiok	93.5%	2.4%
Akutan	13.6%	16.6%
Aleknagik	83.2%	28.8%
Atka	91.8%	16.2%
Chignik	45.2%	0.0%
Chignik Lagoon	56.6%	6.4%
Chignik Lake	91.7%	42.0%
Clarks Point	88.3%	16.1%
Cold Bay	5.4%	0.0%

Location	% Alaska Native	% Below Poverty Level
Dillingham	55.8%	9.5%
Egegik	70.5%	34.1%
Ekuk	33.3%	16.1%
Ekwok	87.0%	52.0%
False Pass	76.5%	17.9%
Igiugig	78.8%	0.0%
Iliamna	66.0%	12.1%
Ivanof Bay	94.3%	18.4%
Karluk	91.5%	3.6%
King Cove	39.2%	10.0%
King Salmon	15.5%	3.0%
Kodiak	12.7%	6.2%
Kokhanok	90.1%	53.4%
Koliganek	96.1%	35.6%
Larsen Bay	84.4%	3.1%
Levelock	82.9%	25.8%
Manokotak	95.6%	28.6%
Naknek	41.0%	1.7%
Nelson Lagoon	80.7%	26.0%
New Stuyahok	95.9%	51.0%
Newhalen	94.4%	22.4%
Nikolski	82.9%	0.0%
Nondalton	89.3%	20.3%
Old Harbor	88.7%	31.5%
Ouzinkie	85.2%	10.2%
Pedro Bay	90.5%	21.9%
Perryville	94.4%	25.4%

1/5/98 c:\worddocs\alaska\sw\sw2envr.doc

Location	% Alaska Native	% Below Poverty Level
Pilot Point	84.9%	12.9%
Port Alsworth	1.8%	0.0%
Port Heiden	86.0%	24.3%
Port Lions	67.6%	5.3%
Sand Point	49.3%	12.5%
Shemya Station	0.5%	0.0%
South Naknek	79.4%	26.3%
Togiak	87.3%	46.3%
Twin Hills	92.4%	50.0%
Ugashik	85.7%	0.0%
Unalaska	8.4%	15.3%

Source: Alaska Department of Community and Regional Affairs Community Database. 1990.

TRANSPORTATION LEGISLATION

This section discusses transportation legislation that has a land based environmental protection component that could constrain transportation development and thus could affect transportation alternatives in Southwest Alaska. The two main legislative actions identified are Section 4(f) of the U.S. Department of Transportation (DOT) Act and Title XI of the Alaska National Interest Lands Conservation Act.

SECTION 4(f)

Section 4(f) of the U.S. Department of Transportation Act states that no administrative approval may be granted for a Department of Transportation action using land from a publicly owned park, recreation area, wildlife and waterfowl refuge, or any significant historic site unless there are no prudent and feasible alternatives to taking this land. In addition to the aforementioned resources, Section 4(f) has been found to apply to Wild and Scenic Rivers and trails of the National Trails System Act. A Section 4(f) evaluation is used to evaluate a range of alternatives when one or more would use Section 4(f) properties. Such an evaluation is used, in particular, to evaluate avoidance of Section 4(f) properties and to determine which alternative and measures to minimize harm should be implemented.

This technical memorandum identifies major state and federal parks, recreation areas, and wildlife and waterfowl refuges that would likely be subject to Section 4(f) and which could impact regional transportation alternatives. This list is not all-inclusive of Section 4(f) resources. Lacking in particular are local parks and historic and cultural sites. However, these sites are unlikely to impact regional transportation alternatives.

ALASKA NATIONAL INTEREST LANDS CONSERVATION ACT (ANILCA)

Title XI of ANILCA provides a process for siting transportation systems through the conservation system units covered by ANILCA. Conservation system units are any Alaska lands in the National Park System, National Wildlife Refuge System, National Wild and Scenic Rivers Systems, National Trails System, National Wilderness Preservation System, or National Forest Monument System.

The approval process required by the Act (Section 1104) requires an application to be filed with each appropriate agency having the authority to grant any authorization. The federal agencies then have 60 days to determine whether or not the application was complete. The draft EIS would be jointly prepared by all agencies with which the application is filed. Title XI modifies the standard NEPA process time line by requiring that a draft EIS be filed by the head of the lead agency within nine months from the date the application was filed. The final EIS is required to be completed within a year of filing. Either of these deadlines may be extended, but such extension would require publication of the reasoning in the *Federal Register*. The records of decision (ROD) of each agency are required within four months of publication of the final EIS. Adhering to these guidelines would result in an EIS with a relatively quick turnaround.

Title XI also modifies the typical NEPA process for areas designated wilderness by elevating the federal decisions from the agencies to the President and Congress (Sec 1106(b)). Title XI provides that each federal agency involved shall submit to the U.S. President “promptly” (presumably at the end of the four-month period required for agency decisions) notification of whether the agency tentatively approves or disapproves each federal authorization and reasons for the decision. Within four months of receiving notification, “the President shall decide whether or not the application for the system concerned should be approved.” If he approves, he sends it on to Congress with a recommendation for approval. If he does not approve, the applicant is considered to have exhausted the administrative process. The project is either canceled or goes to court. If the President sends a recommendation of approval to Congress, the Senate and House of Representatives must approve a joint resolution supporting the project within “the first 120 calendar days of continuous session of the Congress...” If the two houses agree on a joint resolution, then the project goes forward. If they do not, the project is canceled. Section 1106(c)(2) of ANILCA defines “continuous session.”

While the USFWS has dealt with the Title XI provisions in some 30 instances, neither it nor any federal agency has apparently yet tested the Title XI provisions for crossing designated wilderness areas. The closest is an effort currently underway by the Department of Transportation and Public Facilities (DOT&PF) to gain approval for upgrade and realignment of the Sterling Highway in an area that would cross the Resurrection Pass National Recreation Trail and a portion of the Kenai National Wildlife Refuge designated wilderness.

BIBLIOGRAPHY

Alaska Department of Environmental Conservation. Alaska's 1996 Water Quality Assessment Report. August 1996.

Alaska Northwest Books. The Alaska Almanac. 1993.

HDR Alaska, Inc. Cumulative Impacts in Alaska. June 1995.

Kirkwood & Associates. Saint Paul Coastal Management Plan Resource Inventory and Analysis. September 1987.

OTT Engineers. General Management Plan/Development Concept Plan and Environmental Assessment for Lake Clark National Park and Preserve Alaska. May 1982.

Resource Analysts. Aleutians East Coastal Resource Service Area Coastal Management Plan. July 1985.

Resource Analysts. Aleutians West Coastal Resource Service Area Coastal Management Plan. March 1990.

Resource Analysts. Lake and Peninsula Borough Coastal Management Plan. November 1996.

Sekora, Palmer. Aleutian Islands National Wildlife Refuge Wilderness Study Report. September 1973.

State of Alaska Department of Community and Regional Affairs. Bristol Bay Coastal Management Program. June 1992.

State of Alaska Department of Natural Resources. Catalog of the Alaska State Park System. July 1981.

State of Alaska Department of Community and Regional Affairs. Cenaliulriit Coastal Management Program. March 1985.

State of Alaska Department of Community and Regional Affairs. Kodiak Island Borough Coastal Management Program. June 1983.

State of Alaska Department of Natural Resources. Wood-Tikchik State Park. 1974.

United States Department of Interior. Alaska National Interest Lands Conservation Act. 1983

U.S. Fish and Wildlife Service. Alaska Peninsula National Wildlife Refuge Final Comprehensive Conservation Plan, Wilderness Review and Environmental Impact Statement. August 1985.

U.S. Fish and Wildlife Service. Alaska's Threatened and Endangered Species. 1996.

U.S. Fish and Wildlife Service. Alaska Maritime National Wildlife Refuge Final Comprehensive Conservation Plan, Wilderness Review and Environmental Impact Statement. August 1988.

U.S. Fish and Wildlife Service. Becharof National Wildlife Refuge Final Comprehensive Conservation Plan, Wilderness Review and Environmental Impact Statement. April 1985.

U.S. Fish and Wildlife Service. Izembek National Wildlife Refuge Final Comprehensive Conservation Plan, Wilderness Review and Environmental Impact Statement. June 1985.

U.S. Fish and Wildlife Service. Kodiak National Wildlife Refuge Final Comprehensive Conservation Plan, Wilderness Review and Environmental Impact Statement. November 1985.

U.S. Fish and Wildlife Service. Togiak National Wildlife Refuge Final Comprehensive Conservation Plan, Wilderness Review and Environmental Impact Statement. June 1986.